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ABSTRACT

This report provides descriptive statistical information from Phase III-B of the Beginning Teacher Evaluation Study. Within the sample of second and fifth grade teachers in classrooms in public schools in California, approximately six students were identified as target students to be studied during the school year. These students were observed approximately weekly during the period from January to May. The observers recorded student time within subject matter areas of reading and mathematics, focusing on the content of student instructional tasks, the degree of difficulty of instructional tasks for individual students, and student engagement on those tasks. Academic Learning Time (ALT) is defined as time on tasks of intermediate difficulty for the students, directly related to the measures of achievement under study, during which a student is engaged in the instructional task. The report provides descriptive information on ALT for individuals within classes and comparisons across classes for the period from January to May during the 1976-77 school year. (Author)

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BTES

BEGINNING TEACHER EVALUATION STUDY

Technical Note Series

Technical Note IV-1b

Descriptions of Distributions of ALT Within and Across Classes During the B-C Period

Charles W. Fisher
Nikola N. Filby
Richard S. Marliave

October, 1977

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PREFACE

The Far West Laboratory conducts research for the California Commission for Teacher Preparation and Licensing through funds provided by the National Institute of Education. The Commission has responsibility for certifying teachers and teacher training programs in the State of California. The research that the Commission sponsors is designed to help them understand what teacher behaviors or instructional activities are beneficial for students. With a reliable knowledge base in this area the Commission and the institutions that train teachers would be better able to provide training experiences based on empirical findings relating teacher behavior to student achievement.

In previous years, under the Commission's sponsorship, the Beginning Teacher Evaluation Study has conducted empirical research on teaching which has led to the development of a "model" of elementary school classroom instruction. The central construct of the model is academic learning time which is defined as the time a student spends engaged in tasks of intermediate difficulty that are relevant to a defined content area. Briefly, the model states that student achievement in a particular content area is a function of student academic learning time which is, in turn, a function of teaching behaviors and student entering characteristics. In this model teaching behaviors are conceptualized in five functionally interrelated categories: diagnosis, prescription, presentation, monitoring, and feedback.

Phase III-B of the BTES includes a large field study of this model applied to instruction and learning of reading and mathematics at grades

2 and 5. Data were collected during the 1976-77 academic year. Three major testing occasions were held in October, December, and May with a follow-up session in September, 1977. These testing occasions are referred to as occasions A, B, C, and D and serve to delimit major segments of the complete data set. Analyses will be reported for the A-B, B-C, and A-B-C-D periods. Within these periods, analyses will be carried out on the relationships between achievement and acedemic learning time and between academic learning time and teaching behaviors.

The assessment of amounts of academic learning time in various areas of reading and mathematics is an important element in the study. The complex observation system developed by the BTES staff was the major source of this information. The Laboratory team which collected, compiled, and processed these data was thoughtfully directed by Nikola Filby and Richard Marliave. This technical note provides descriptive information on the distribution of academic learning time within and across classes for the B-C period. Analogous information for the A-B period is presented in Technical Note IV-1a.

These notes and others in the Phase III-B series are intended to present information on major data sources at several points in the analysis process. Subsequent notes will provide descriptive information on other data sources and report on relational analyses between elements of the model.

The data described in this report represent a remarkable amount of work. Our appreciation goes to each of the field workers, coders, computing staff members, teachers, students, and others who contributed to this effort. We give special recognition to the teachers and students in California schools who, by their voluntary participation, made this research possible.

Charles W. Fisher
Principal Investigator
Beginning Teacher Evaluation Study
October, 1977

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I. INTRODUCTION

This Technical Note presents descriptive statistics generated for the initial analyses of BTES data from the B-C period of Phase III-B data collection (January to May, 1977). This is one of several Technical Notes[1] presenting descriptive statistics from Phase III-B. The data presented here pertain to Academic Learning Time (ALT) as it was measured by observation of instructional content, student engagement, and difficulty levels.

Presentation of the descriptive statistics is preceded by brief accounts of the instrumentation and data collection procedures used to obtain these data. The instrumentation and procedures apply to all of the data collected by direct observation. This includes data on ALT for both the A-B and B-C periods and teaching behaviors for both the A-B and B-C periods. Descriptive statistics for these four data sets are presented in Technical Notes IV-1a, IV-1b, IV-3a, and IV-3b respectively. The descriptive reports of ALT include an account of all direct observation instrumentation and procedures. These procedures comprise one cohesive set of data collection operations. The resultant data are intended for several different sets of analyses (i.e., both ALT to achievement and teaching behaviors to ALT in each of the A-B and B-C periods). The subsequent reports of other analyses based on this data source will simply cite the description of instrumentation and procedures presented in the descriptive ALT reports (Technical Notes IV-1a and IV-1b).

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[1]For descriptions of the Phase III-B process data see Technical Note IV-1a (Filby & Marliave, 1977), Technical Note IV-2a (Dishaw, 1977a), Technical Note IV-2b (Dishaw, 1977b), Technical Note IV-3a (Filby, 1977), and Technical Note IV-3b (Filby & Fisher, 1977).

II. INSTRUMENTATION

The instrumentation used to collect the data described in this report consists of an observation coding form and an observer's manual that specifies and elaborates the coding categories and the procedures for observation. This instrumentation was developed over the multi-year course of the BTES program of research. The variables and procedures are based on the previous experience and findings of the study. In addition, a field test of these observation procedures was carried out during the final stages of development. This field test included the training of personnel who had no previous experience with the observation system, as well as the collection of paired observation data for estimating inter-observer reliability. As a result of experience gained by analyzing these field test data, it was decided that an optically-scannable coding form would be used for the collection of Phase III-B direct observation data as a means of facilitating data processing. This form appears in Appendix A. A brief outline of the observation categories appears in Appendix B.

A complete account of the development of this instrumentation, including developmental BTES activities, field test procedures, and field test results, can be found in Technical Report I-5 (Marliave, Fisher, Filby, & Dishaw, 1977). In addition, this report presents the optically-scannable coding form and the observer's manual, with a complete description of observation procedures.

III. DATA COLLECTION

Sample.

The second grade sample included 139 students from 25 classes. Twenty-seven teachers were responsible for instruction in these 25 classes (more than one teacher was involved in classes with "team-teaching"). The fifth grade sample consisted of 122 students from 21 classes with 30 teachers. All participating teachers were volunteers, recruited on the basis of meetings held in schools throughout the San Francisco Bay Area (Howell & Rice, 1977). Six students were selected from each participating class on the basis of a selection test administered at the outset of the study. This test was designed to identify students of comparable entering achievement levels from each of the participating classes so that the BTES achievement tests would be appropriate for all students in the study, despite the diversity of communities from which they were obtained (Cahen, 1976). Attrition, due to factors such as absences during testing and families moving during the study, resulted in the sample sizes cited above (i.e., an average of slightly less than six students per class).

Training of observers.

Nineteen carefully selected (Howell & Rice, 1977) field personnel were trained for observation. This training covered a three week period in the fall of 1976. During the first two days the observation coding form and manual were presented along with extensive discussion of the coding procedures. This was followed by nine days of practice observation in the morning and meetings in the afternoon.

The practice observation was held in participating schools, with trainees observing in pairs. Observers were paired with different persons

and observed in different classes each day. The general procedure was to observe for about 20 minutes in the class, thereafter leaving the class to discuss the observation. This cycle was repeated as time allowed during the course of the morning.

Following the morning observation, the observers convened at the Far West Laboratory to discuss procedures in the full group of nineteen led by one regular FWL staff member who was experienced in the observation procedure. These meetings generally focused on problems that had arisen during the morning's practice observation. At several of these meetings observers summed the time they had coded for each of certain selected categories, charting these results on the blackboard in such a way that discrepancies between paired observers could be identified. The more significant discrepancies were discussed, with detailed descriptions of the classroom events coded discrepantly and careful examination of the appropriate procedures for coding such events. One additional activity, conducted at three training meetings, was the description of hypothetical events by the leader of the training. The trainees were asked to code these hypothetical events. This was followed by a group discussion of the appropriate coding procedure for the hypothetical events. Special activities were also conducted when the need for them arose. For example, when disagreement surfaced regarding the appropriate procedures for categorizing difficulty levels of second grade oral reading, tape recordings of several second grade students reading aloud were obtained and played at a meeting. These samples of second grade oral reading performance were discussed and a consensus was reached for coding their difficulty levels.

This training was followed by three full days of paired observation, carried out to determine whether the field personnel were prepared to begin the actual data collection. Selected categories of this paired

observation data were compiled manually and examined for inter-rater reliability. (Optical scanning procedures were not used to compile these data because this relatively small data set could be compiled more rapidly by hand.) The results were judged to be of adequate inter-observer reliability for the purposes of initiating actual data collection. Therefore, a final training day was devoted to a meeting to review all data collection procedures (including several other than observation, see Howell and Rice, 1977). Actual data collection was initiated thereafter.

The inter-observer reliability results for the data collected at the end of the three-week fall training period are reported in Table 1. The labels for individual observation categories are entered for rows on the left side of the table. The headings along the top of the table indicate the statistic presented in each column. These statistics are (from left to right) a coefficient of reliability, a coefficient of correlation, the mean for the first of the paired observations, the mean for the second of the paired observations, the standard deviation for the first of the paired observations, the standard deviation for the second of the paired observations, and the standard error of measurement for the paired observations. All statistics are based upon the paired entries (for paired observers) of time in a specific coding category (as labeled for each row) summed for a single student on a single day. The data were entered as minutes per day.

The reliability coefficient presented in the first column (unadjusted multiple measurement coefficient; see Winer, 1962) gives the inter-observer reliability of the average of summed observation data from two observers, each coding the same student on the same day. An "unadjusted" coefficient is used so that any systematic difference between the observations entered first and those entered second will be considered part of the error of observational measurement.

Table 1

Fall Training
Inter-Observer Reliability

Coding Category	W* 12	r** 12	Mean 1	Mean 2	SD 1	SD 2	SEM
Wait	.45	.32	4.4	5.1	6.4	10.4	7.0
Transition	.59	.42	15.7	14.9	9.9	8.7	6.4
Decoding	.97	.93	7.6	7.9	12.1	12.6	3.3
Word Structure	.87	.78	1.9	1.6	4.5	3.9	2.0
Word Meaning	.89	.78	4.7	4.6	9.9	9.6	4.4
Practice Reading	.84	.75	15.5	12.4	15.2	13.1	7.2
Addition & Subtraction (no regroup)	.96	.93	7.3	6.9	11.5	10.7	3.1
Computational Transfer	.70	.64	.86	1.3	2.6	4.6	2.5
Multiplication	.91	.83	2.0	1.5	9.0	7.9	0.8
Spatial Application	.84	.77	1.2	2.3	6.2	8.8	1.5
Mathematics Related	.88	.86	4.8	8.0	12.8	18.6	7.4
Other-paced	.90	.83	33.4	31.5	26.4	25.8	10.9
Easy	.69	.52	37.6	36.6	26.8	25.6	18.1
Hard	.76	.65	2.8	1.6	8.0	5.9	4.3
Engaged, Directions	.18	.09	3.5	3.2	4.4	4.2	4.1
Not Engaged, Interim	.57	.40	8.9	8.3	8.9	9.1	7.0
Academic Feedback	.77	.63	10.4	11.0	9.8	11.7	6.6
Explanation, Planned	.75	.61	3.8	4.0	5.7	6.8	4.0
Task Engagement Feedback	.31	.18	.70	.50	1.7	1.9	1.6

*W_{12} is Winer's (1962) unadjusted multiple measurement coefficient (r_3) for inter-observer reliability.

**r_{12} is the Pearson product moment correlation between the paired observations.

It should be noted that the inter-observer reliability for reading and mathematics content categories was generally quite high, with no coefficient below .70 and several near or above .90. One student behavior category and one teacher behavior category were unacceptably low ("engaged, directions" and "task engagement feedback" respectively). However, neither category represents a very large proportion of the student day. Task engagement feedback represented a particularly small amount of time (less than a minute per day). Therefore, it was anticipated that data summed over many days of observation for the A-B and B-C periods would show higher reliability for these categories.

Although the inter-observer reliability at the end of training was sufficient for the purposes of initial data collection, it was apparent that improvement was still desirable for some categories. In addition, FWL staff believed that ongoing training would be desirable to maintain the level of observation skills developed in training. Therefore, weekly half-day meetings were held at FWL to discuss observation procedures. These discussions usually focused on problems raised by the observers. In addition, practice coding of hypothetical classroom events was conducted on several occasions. These weekly meetings were continued throughout the course of the Phase III-B data collection (both A-B and B-C periods), although the meetings were held for only one to two hours during the latter half of the study.

In addition to the initial three weeks of training and the weekly meetings held during the course of data collection, an additional three days of training was conducted during the first week of January as a review designed to refresh observer skills following the winter break and preceding the start of the B-C data collection period. This review training session

followed the same general procedures as the initial training period, including paired observations each morning and general meetings in the afternoon. In addition, preliminary results of the A-B observation reliability were distributed and discussed. Written feedback to individual observers regarding their performance during the A-B period was distributed and discussed on an individual basis as needed. A list of performance objectives was distributed and discussed during one of the afternoon meetings (see Appendix A-4, page 1, Howell & Rice, 1977). There was also one set of hypothetical classroom events for practice coding and discussion.

Data processing procedures.

The observation data were processed by three levels of "cleaning" operation: 1) checks performed on the raw data (the observation sheets themselves), 2) checks performed on computer print-outs of the untransformed data taken directly from the observation sheets, and 3) checks performed on computer files using programmed routines.

Checks performed on the raw data served two purposes. First, they allowed for certain corrections that could not be readily performed with computer print-outs, such as comparisons of coded identification numbers and handwritten names of the teachers or students represented by those numbers. Second, these checks could be carried out by observers shortly after the data were collected, so that the observers would be made concretely aware of the number and types of errors that they were producing. This provided a form of feedback that served to reduce the frequency of subsequent errors. Written instructions for these checks of observation sheets and a tally sheet to record the frequency of errors found of various types were used by observers when they performed these checks.

The instructions and tally sheet are presented in Appendix D-4, pages one through six, of Technical Note II-1 (Howell & Rice, 1977).

Whenever errors were found on the observation sheets, they were corrected directly thereon. In some cases this required judgements that were generally made by the checker in consultation with FWL staff and the observer who did the original coding. Usually these judgemental corrections involved missing event codes, such as an event in mathematics without a setting code (self-paced or other-paced). These corrections could generally be made on the basis of the context provided by other events coded for the same student or the same group of students during the same time period. In a few cases short time blocks were missing, such as when an observer arrived at school late. These missing time blocks were coded using estimates based upon observation records from other days for the same students at that same time block.

The checks performed on computer print-outs of the untransformed data served primarily to identify errors in the coding of the various sources of identification information. The advantage of this procedure was that the identification information could be listed in a format that highlighted inconsistencies. The corrections could then be determined with reference to the original observation sheets if necessary. The major disadvantage to this approach was that the corrections could not simply be entered manually on the observation sheets themselves. Rather, corrections had to be made on the computer file directly.

The checks of computer print-outs were performed by observers and temporary coding personnel. Persons performing these checks always referred to a written set of detailed instructions. These instructions are presented in Appendix D-4, pages seven and eight, of Technical Note II-1 (Howell & Rice, 1977).

The final checks of the observation data were performed on the computer files using programmed computer routines. These checks ranged from the identification of missing information to the determination of logical errors in the observation coding. Corrections were made by examining the original observation sheets when necessary and by routine procedures when possible. In some cases events were eliminated from the data set because no appropriate correction could be determined. (Actually, such events were recorded as time during which the student was absent, because this prevented distortions in computations of proportions of the student day for the various observation variables.)

IV. B-C RESULTS

The descriptive statistics presented here apply to ALT during the B-C period of Phase III-B as measured with direct observation. ALT is instructional time during which the student is engaged at an intermediate level of difficulty in content relevant to the outcomes of concern. The outcomes of concern here are reading and mathematics achievement. Therefore most of the descriptive statistics presented focus on engagement and difficulty levels in reading and in mathematics for students at the grade levels studied (two and five). In addition, data are presented on two possible sources of detraction from ALT: non-instructional time and non-engaged student behavior. There are also some data describing the relationship of setting to engagement and difficulty levels in reading and mathematics. Finally, descriptive data are presented on various sub-content areas within reading and within mathematics in relationship to student engagement and levels of difficulty.

The reader may find Appendix B useful when reviewing these results, insofar as this appendix briefly describes the variables for which data are presented here. Technical Note I-5 (Marliave, Fisher, Filby, & Dishaw, 1977) provides complete descriptions of these variables.

Table 2 provides an over-all description of the school day in terms of minutes per day in general content categories. Means and standard deviations are included for all second- and all fifth-grade students. It is interesting to note that the largest single category within the day is reading and language arts. This is true at each grade. Note, however, that a broad definition of reading is used here, including time in all reading-related activities. It should also be noted that the time for

Table 2

Where the Day Goes--
Minutes per Day in General Content Categories

Time Category	Grade 2		Grade 5	
Reading and Language Arts	88	(16)	110	(20)
Mathematics	36	(8)	44	(13)
Other Academic	8	(6)	17	(11)
Non-Academic	55	(17)	65	(18)
Break	75	(9)	77	(10)
Wait	4	(3)	4	(3)
Transition	34	(6)	34	(7)
Management	6	(3)	9	(5)
Length of the School Day	307	(10)	361	(13)

Entries are: Mean (Standard Deviation)

reading and for mathematics in this table includes non-engaged student behavior time.

Table 2 also shows that the grade 5 school day is longer than that for grade 2. This is due primarily to the use of "split-day" scheduling at grade 2, where some students start school early and others finish late. Table 2 reveals that almost half of the extra school time at grade 5 (compared to grade 2) is devoted to reading. When compared with corresponding data from the A-B period, it is clear that the distribution of time in the categories of Table 2 is quite similar for the two periods.

One other aspect of Table 2 that should be mentioned is the small variance in the length of the school day relative to the various subcategories of time within the day. This was found despite the fact that the data were obtained from classes across several different school districts. This suggests that there is much to be gained, in the study of instructional time, by breaking the school day into more refined subcomponents. That is, the amount of schooling may remain relatively constant while the amounts of different kinds of instruction vary considerably.

Tables 3, 4, 5, and 6 present means and standard deviations for engagement by difficulty. Included are engaged and non-engaged time, easy, medium, and hard time, and the six intersections of these categories. The data are shown as percentages for grade 2 reading (Table 3), grade 2 mathematics (Table 4), grade 5 reading (Table 5), and grade 5 mathematics (Table 6). The entries in these tables are also very similar to those for the A-B period.

Note that engagement is remarkably constant across grades (2 and 5) and content (reading and mathematics). The definition of engagement used in Phase III-B excludes transition, management, and wait times from the

Table 3

Engagement by Difficulty in Grade 2 Reading
(Percentages for Total Sample)

Engagement	Difficulty			Total
	Easy	Medium	Hard	
Engaged	41 (14)	32 (12)	1 (2)	73 (9)
Not Engaged	13 (6)	13 (8)	1 (1)	27 (9)
Total	53 (17)	45 (16)	2 (3)	100%

Entries are: Mean (Standard Deviation)

Table 4

Engagement by Difficulty in Grade 2 Mathematics
(Percentages for Total Sample)

Engagement	Difficulty			Total
	Easy	Medium	Hard	
Engaged	36 (17)	32 (14)	3 (4)	71 (11)
Not Engaged	15 (8)	13 (10)	2 (3)	29 (11)
Total	51 (21)	45 (19)	4 (6)	100%

Entries are: Mean (Standard Deviation)

Table 5

Engagement by Difficulty in Grade 5 Reading
(Percentages for Total Sample)

Engagement	Difficulty			Total
	Easy	Medium	Hard	
Engaged	36 (12)	37 (13)	1 (1)	74 (11)
Not Engaged	12 (7)	14 (8)	0 (1)	26 (11)
Total	48 (15)	51 (15)	1 (2)	100%

Entries are: Mean (Standard Deviation)

Table 6

Engagement by Difficulty in Grade 5 Mathematics
(Percentages for Total Sample)

Engagement	Difficulty			Total
	Easy	Medium	Hard	
Engaged	28 (18)	44 (18)	2 (4)	74 (13)
Not Engaged	9 (7)	16 (11)	1 (2)	26 (13)
Total	37 (22)	61 (22)	3 (6)	100%

Entries are: Mean (Standard Deviation)

calculation of engagement rates, because these are treated as general content categories outside of reading and mathematics. This results in higher engagement rates (at about 75 percent) than previous procedures indicated for Phase III-A Continuation.

The difficulty level data in Table 3 through 6 indicate slight trends toward a higher proportion of medium at grade 5 than at grade 2 and a higher proportion of medium in grade 5 mathematics than in grade 5 reading. These trends appeared in both the A-B and the B-C data. In addition, there is a slight trend toward more medium in the B-C period than in the A-B period for each of the four quadrants. It is also interesting to note that the ratio of engaged to non-engaged times within each difficulty category is reasonably constant. This sugggests that difficulty levels may not have much impact upon engagement rates.

The reader may also note that Tables 3 through 6 show approximately equal proportions of time in the easy and medium categories and very small proportions (three percent or less) of time in the hard category. This is a function of the definitions of these categories (see Technical Report I-5, Marliave, et al.). One other aspect of Tables 3 through 6 that should be noted is the relatively greater variability of both engagement and difficulty in mathematics than in reading. We will see later that this trend is also found for engagement and difficulty within the self- and other-paced settings.

Tables 7, 8, 9, and 10 present the means and standard deviations for engagement and difficulty percentages in each of the second and fifth grade classes for both reading and mathematics. The identification numbers for classes are consistent across content (reading and mathematics) within grade. Therefore, reading and mathematics results can be compared

Table 7

Daily Time (in Minutes)
Engagement and Difficulty (Percentages)
In Grade 2 Reading, by Class

Class	Daily Time		Engagement Percentage		Difficulty Percentages					
					% Easy		% Medium		% Hard	
1	106	(3)	67	(4)	33	(10)	67	(10)	0	(0)
2	79	(8)	59	(5)	53	(15)	42	(10)	5	(7)
3	83	(4)	78	(5)	56	(16)	43	(16)	0	(1)
4	47	(8)	63	(5)	48	(8)	50	(7)	2	(2)
5	96	(5)	69	(6)	54	(10)	43	(10)	3	(1)
6	65	(5)	71	(5)	64	(12)	35	(11)	2	(2)
7	93	(7)	87	(2)	64	(9)	35	(9)	0	(0)
8	75	(6)	61	(10)	47	(21)	45	(15)	8	(7)
9	90	(1)	73	(9)	49	(20)	47	(18)	4	(3)
10	93	(6)	68	(6)	73	(19)	26	(19)	0	(1)
11	118	(7)	75	(4)	54	(8)	45	(8)	1	(0)
12	83	(5)	79	(3)	59	(15)	40	(14)	1	(1)
13	87	(1)	76	(3)	61	(6)	36	(6)	3	(0)
14	103	(6)	81	(4)	36	(10)	61	(7)	2	(6)
15	96	(3)	57	(8)	39	(9)	58	(7)	2	(3)
16	66	(3)	81	(5)	54	(15)	46	(15)	0	(0)
17	118	(3)	74	(2)	64	(17)	34	(17)	1	(2)
18	101	(4)	81	(4)	50	(9)	47	(8)	3	(1)
19	90	(2)	70	(7)	58	(11)	39	(10)	3	(2)
20	80	(4)	83	(4)	59	(20)	41	(19)	0	(1)
21	82	(4)	66	(5)	75	(8)	24	(8)	1	(1)
22	86	(6)	82	(5)	32	(13)	67	(11)	1	(2)
23	85	(6)	76	(5)	49	(13)	50	(12)	1	(1)
24	90	(2)	80	(2)	49	(29)	50	(28)	1	(2)
25	78	(5)	83	(2)	56	(15)	44	(15)	0	(0)
Total Sample	88	(16)	73	(9)	53	(17)	45	(16)	2	(3)

Entries are: Mean (Standard Deviation)

Table 8

Daily Time (in Minutes)
Engagement and Difficulty (Percentages)
in Grade 2 Mathematics, by Class

Class	Daily Time		Engagement Percentage		Difficulty Percentages					
					% Easy		% Medium		% Hard	
1	24	(4)	62	(12)	43	(24)	54	(26)	3	(5)
2	41	(5)	59	(12)	46	(15)	40	(16)	13	(9)
3	42	(4)	79	(5)	25	(21)	68	(17)	7	(5)
4	51	(3)	65	(6)	45	(6)	51	(6)	4	(2)
5	29	(4)	71	(8)	67	(16)	33	(15)	1	(2)
6	24	(4)	75	(8)	51	(14)	46	(16)	2	(4)
7	37	(2)	83	(7)	72	(15)	28	(16)	0	(1)
8	42	(4)	63	(14)	59	(22)	35	(21)	6	(4)
9	39	(2)	66	(4)	60	(18)	34	(14)	6	(4)
10	35	(2)	65	(4)	49	(21)	45	(20)	5	(6)
11	34	(4)	60	(8)	59	(11)	41	(10)	0	(1)
12	37	(4)	79	(4)	66	(14)	33	(13)	2	(2)
13	45	(1)	75	(7)	55	(13)	43	(13)	2	(1)
14	36	(2)	77	(3)	22	(12)	74	(7)	3	(7)
15	43	(3)	54	(9)	37	(15)	60	(14)	2	(4)
16	16	(1)	86	(6)	65	(15)	35	(15)	0	(1)
17	32	(2)	85	(3)	73	(7)	25	(6)	2	(3)
18	39	(2)	73	(8)	21	(8)	66	(10)	12	(11)
19	22	(3)	62	(8)	56	(11)	38	(10)	6	(4)
20	43	(5)	71	(7)	47	(21)	53	(21)	0	(0)
21	37	(3)	58	(8)	50	(13)	36	(9)	14	(7)
22	43	(3)	79	(6)	55	(10)	45	(10)	0	(1)
23	38	(2)	73	(4)	67	(12)	33	(12)	0	(0)
24	36	(1)	71	(8)	43	(24)	50	(21)	6	(6)
25	43	(2)	84	(3)	20	(13)	69	(8)	11	(6)
Total Sample	36	(8)	71	(11)	51	(21)	45	(19)	4	(6)

Entries are: Mean (Standard Deviation)

Table 9

Daily Time (in Minutes)
Engagement and Difficulty (Percentages)
in Grade 5 Reading, by Class

Class	Daily Time		Engagement Percentage		Difficulty Percentages					
					% Easy		% Medium		% Hard	
1	102	(3)	84	(2)	29	(5)	68	(5)	3	(1)
3	80	(2)	79	(6)	53	(6)	42	(5)	4	(1)
4	92	(4)	81	(5)	45	(19)	55	(18)	1	(1)
5	110	(8)	67	(11)	59	(13)	41	(12)	0	(1)
6	68	(7)	48	(9)	55	(17)	39	(16)	6	(4)
8	104	(13)	83	(3)	51	(6)	48	(6)	1	(1)
9	127	(4)	82	(4)	39	(6)	60	(6)	1	(1)
10	137	(11)	87	(3)	45	(16)	54	(15)	1	(1)
11	119	(5)	81	(4)	44	(10)	56	(10)	0	(1)
12	137	(9)	78	(7)	28	(9)	71	(9)	0	(0)
14	130	(4)	75	(5)	62	(11)	38	(11)	0	(0)
16	95	(8)	71	(11)	56	(17)	40	(17)	1	(2)
17	108	(15)	63	(9)	54	(11)	46	(11)	0	(0)
18	106	(2)	78	(9)	49	(11)	51	(11)	0	(0)
19	108	(6)	69	(6)	53	(15)	47	(14)	1	(1)
21	129	(9)	75	(8)	59	(6)	37	(6)	3	(1)
23	121	(6)	78	(6)	40	(18)	60	(18)	1	(0)
24	95	(10)	72	(5)	45	(13)	55	(13)	0	(0)
25	129	(3)	70	(9)	36	(12)	64	(12)	0	(0)
26	102	(8)	63	(12)	34	(11)	66	(11)	0	(0)
27	88	(3)	68	(10)	56	(7)	40	(5)	4	(2)
Total Sample	110	(20)	74	(11)	48	(15)	51	(15)	1	(2)

Entries are: Mean (Standard Deviation)

Table 10

Daily Time (in Minutes)
Engagement and Difficulty (Percentages)
in Grade 5 Mathematics, by Class

Class	Daily Time		Engagement Percentage		Difficulty Percentages					
					% Easy		% Medium		% Hard	
1	41	(3)	84	(3)	23	(10)	75	(8)	1	(3)
3	20	(3)	83	(3)	25	(12)	70	(13)	5	(5)
4	29	(2)	84	(7)	43	(25)	45	(16)	13	(15)
5	42	(4)	61	(9)	13	(7)	83	(6)	4	(4)
6	53	(7)	50	(9)	40	(12)	57	(10)	4	(4)
8	33	(13)	87	(6)	47	(24)	52	(24)	1	(1)
9	36	(1)	86	(2)	23	(17)	68	(14)	9	(11)
10	40	(2)	89	(6)	18	(15)	79	(14)	3	(3)
11	41	(2)	75	(10)	25	(12)	73	(10)	2	(3)
12	45	(4)	68	(9)	24	(22)	74	(21)	2	(5)
14	62	(2)	81	(5)	51	(15)	48	(14)	1	(2)
16	44	(6)	73	(10)	52	(20)	44	(16)	4	(5)
17	47	(13)	62	(14)	59	(14)	40	(13)	1	(2)
18	43	(4)	67	(12)	31	(20)	65	(18)	5	(8)
19	43	(4)	77	(6)	72	(10)	28	(10)	1	(1)
21	32	(5)	71	(11)	66	(19)	30	(17)	4	(6)
23	56	(6)	87	(1)	29	(13)	72	(13)	0	(0)
24	73	(7)	73	(5)	28	(8)	72	(8)	0	(0)
25	64	(2)	70	(12)	19	(15)	77	(18)	5	(7)
26	41	(9)	56	(14)	17	(14)	83	(14)	0	(0)
27	44	(4)	75	(5)	42	(10)	53	(9)	5	(3)
Total Sample	44	(13)	74	(13)	37	(22)	60	(22)	3	(6)

Entries are: Mean (Standard Deviation)

for each class. First, note that there is wide variability among classes in all aspects of ALT. Classes vary in the daily time allocated to each subject at each grade level. In all four cases, there is at least a ratio of 2 to 1 between the class with the highest amount of daily time and the class with the lowest amount of daily time. In addition, there is considerable variability among classes in observed engagement rates. In grade 2 mathematics, the range is from a low of 54% to a high of 86%. The range in the other quadrants is comparable. Finally, classes vary in the difficulty level of the work assigned. The percentage of medium in grade 2 mathematics varies from a low of 25% to a high of 69%. The standard deviations for individual classes indicate that there is also considerable variability within class on these factors.

Note that the classes in both grades show considerable consistency on engagement across content areas. The grade 2 correlation of engagement means for reading with mathematics is .77; that for grade 5 is .85. The correlations of class engagement means for the A-B and B-C periods were also high. The coefficients for grade 2 reading, grade 2 mathematics, grade 5 reading, and grade 5 mathematics were .78, .82, .83, and .87 respectively. There is considerably less consistency across content areas for indices of difficulty.

Table 11 presents means and standard deviations for non-instructional time in each of three general categories: wait, transition, and management. The data are in minutes per day for grade 2 students and for grade 5 students. Table 12 shows these means and standard deviations for each grade 2 class. Table 13 shows them for each grade 5 class. Note the similarity between the two grades in the amounts of time in the three non-instructional time categories. Note, also, the diversity among classes

Table 11

General Non-Instructional Time
(in Minutes per Day for Total Sample)

Grade	Time Category		
	Wait	Transition	Management
2	4 (3)	34 (6)	6 (3)
5	4 (3)	34 (7)	9 (5)

Entries are: Mean (Standard Deviation)

Table 12

General Non-Instructional Time
(in Minutes per Day)
in Grade 2, by Class

Class	Time Category		
	Wait	Transition	Management
1	0 (0.3)	30 (2.1)	12 (1.9)
2	2 (1.1)	26 (5.4)	4 (1.3)
3	2 (0.9)	46 (2.0)	6 (1.4)
4	2 (0.9)	32 (1.4)	9 (1.4)
5	6 (2.7)	37 (6.0)	3 (1.6)
6	3 (0.9)	26 (4.1)	7 (0.8)
7	1 (1.1)	33 (2.8)	5 (0.8)
8	11 (1.5)	36 (3.3)	3 (0.7)
9	5 (1.5)	35 (2.2)	3 (0.4)
10	4 (1.1)	37 (1.0)	4 (0.6)
11	3 (0.9)	29 (1.6)	6 (0.9)
12	4 (1.1)	29 (1.6)	5 (1.3)
13	2 (0.5)	29 (4.2)	8 (2.1)
14	9 (1.5)	34 (1.7)	11 (1.1)
15	12 (2.2)	44 (1.5)	1 (0.7)
16	2 (1.2)	24 (1.0)	4 (0.9)
17	5 (1.5)	36 (3.8)	8 (2.1)
18	3 (0.4)	37 (1.3)	7 (0.6)
19	4 (1.0)	35 (1.8)	9 (0.8)
20	4 (1.7)	32 (2.3)	11 (0.4)
21	6 (1.1)	33 (2.1)	6 (1.3)
22	3 (1.6)	43 (2.8)	7 (0.9)
23	4 (1.1)	43 (2.8)	3 (0.6)
24	1 (0.6)	28 (2.0)	11 (0.8)
25	3 (0.9)	41 (3.1)	5 (0.7)
Total Sample	4 (3.1)	34 (6.3)	6 (3.0)

Entries Are: Mean (Standard Deviation)

Table 13

General Non-Instructional Time
(in Minutes per Day)
in Grade 5, by Class

Class	Time Category					
	Wait		Transition		Management	
1	4	(1.4)	34	(0.8)	6	(0.9)
3	8	(1.5)	29	(1.4)	17	(0.5)
4	4	(0.9)	33	(0.6)	6	(0.9)
5	1	(0.9)	44	(3.6)	11	(4.0)
6	3	(1.1)	35	(1.3)	5	(1.7)
8	2	(3.0)	38	(4.6)	13	(1.0)
9	11	(1.2)	33	(5.4)	9	(2.1)
10	2	(0.7)	50	(1.1)	9	(0.9)
11	3	(1.2)	30	(6.0)	5	(3.1)
12	1	(0.5)	32	(1.4)	4	(1.0)
14	5	(1.0)	25	(0.9)	14	(1.1)
16	8	(2.2)	27	(3.3)	15	(2.2)
17	5	(2.2)	36	(2.3)	14	(11.7)
18	2	(1.0)	34	(2.0)	7	(1.7)
19	2	(1.0)	39	(1.1)	5	(4.8)
21	6	(1.7)	26	(4.4)	7	(1.6)
23	2	(0.5)	29	(1.0)	5	(2.1)
24	1	(0.6)	38	(2.7)	10	(0.8)
25	10	(2.9)	41	(0.9)	5	(0.3)
26	3	(1.5)	30	(2.9)	9	(2.7)
27	6	(1.1)	39	(1.8)	12	(2.8)
Total Sample	4	(3.1)	34	(6.7)	9	(5.0)

Entries are: Mean (Standard Deviation)

for these categories. These data for the B-C period were very similar to analogous figures for the A-B period.

Table 14 presents means and standard deviations for each of the three non-engaged student behaviors: interim activity, waiting[1], and off-task. The data are percentages for grade 2 students and for grade 5 students. Table 15 shows these means and standard deviations for each grade 2 class. Table 16 presents analogous data for each grade 5 class. Note the consistency in these three categories across the two grades and content areas. Time in the waiting category, however, is slightly lower at grade 5 than at grade 2. Note, also, the considerable variability across classes for each of the three non-engaged student behaviors and the relatively high variance within individual classes. The data on non-engaged student behaviors is very consistent when total-sample summary statistics for the A-B and B-C periods are compared.

Table 17 presents means and standard deviations for engagement and difficulty within each of the two settings, self-paced and other-paced. The data are percentages for grade 2 reading, grade 2 mathematics, grade 5 reading, and grade 5 mathematics. Note that a greater proportion of time is devoted to self-paced activities. This tendency to use self-paced settings increased slightly from the A-B to the B-C period.

Note that the engagement rates for other-paced activities are consistently higher than for self-paced activities. It is also interesting that there is a consistent trend toward a slightly greater proportion of activities at the easy level in self-paced settings than in other-paced settings. Finally, note that there is consistently greater variability in mathematics than in reading (as indicated by standard deviations).

[1]"Waiting" refers to the student behavior of waiting for help during reading or mathematics instruction. "Wait," a category found in Tables 11, 12, and 13, refers to periods during which no instruction or other activity is occurring.

Table 14

Non-Engaged Behavior
(Percentages for Total Sample)

Grade	Reading							
	Interim		Wait		Off		Total	
2	10	(4)	6	(3)	11	(8)	27	(9)
5	9	(3)	4	(2)	14	(10)	26	(11)

Grade	Mathematics							
	Interim		Wait		Off		Total	
2	8	(4)	7	(5)	14	(11)	29	(11)
5	7	(4)	4	(3)	14	(12)	26	(13)

Entries are: Mean (Standard Deviation)

Table 15

Non-Engaged Behavior (Percentages)
in Grade 2, by Class

Class	Reading							
	Interim		Wait		Off		Total	
1	11	(4)	9	(3)	12	(4)	33	(4)
2	9	(2)	3	(1)	29	(7)	41	(5)
3	11	(1)	4	(2)	7	(4)	22	(5)
4	10	(2)	2	(1)	25	(4)	37	(5)
5	13	(2)	7	(1)	11	(5)	31	(6)
6	10	(3)	6	(2)	13	(5)	29	(5)
7	4	(1)	4	(2)	5	(3)	13	(2)
8	7	(4)	9	(3)	23	(11)	39	(10)
9	18	(4)	3	(2)	6	(4)	27	(9)
10	12	(3)	4	(1)	16	(6)	32	(6)
11	10	(1)	5	(1)	10	(5)	25	(4)
12	9	(2)	5	(1)	7	(3)	21	(3)
13	13	(1)	3	(2)	7	(3)	24	(3)
14	6	(2)	7	(1)	6	(3)	19	(4)
15	11	(1)	13	(3)	19	(8)	43	(8)
16	7	(3)	4	(1)	8	(4)	19	(5)
17	13	(2)	11	(2)	3	(2)	26	(2)
18	10	(1)	4	(1)	5	(3)	19	(4)
19	14	(4)	6	(1)	10	(6)	30	(7)
20	7	(2)	2	(1)	8	(3)	17	(4)
21	14	(2)	6	(1)	14	(5)	34	(5)
22	9	(1)	2	(1)	7	(6)	18	(5)
23	12	(2)	4	(1)	7	(3)	24	(5)
24	8	(1)	4	(1)	8	(2)	20	(2)
25	7	(2)	6	(3)	4	(2)	17	(2)
Total Sample	10	(4)	6	(3)	11	(8)	27	(9)

Entries are: Mean (Standard Deviation)

Table 15 (continued)

Non-Engaged Behavior (Percentages)
in Grade 2, by Class

Class	Mathematics							
	Interim		Wait		Off		Total	
1	3	(3)	9	(5)	26	(14)	38	(12)
2	6	(4)	5	(3)	31	(16)	41	(13)
3	9	(2)	6	(2)	5	(4)	21	(5)
4	8	(3)	3	(2)	25	(7)	35	(6)
5	10	(3)	7	(2)	11	(7)	29	(8)
6	10	(5)	6	(5)	8	(5)	25	(8)
7	4	(1)	7	(1)	6	(6)	17	(7)
8	6	(4)	6	(3)	26	(14)	37	(14)
9	16	(5)	9	(3)	9	(4)	35	(4)
10	10	(2)	3	(2)	23	(3)	35	(4)
11	13	(2)	3	(1)	24	(8)	40	(8)
12	5	(1)	5	(3)	11	(7)	21	(4)
13	12	(2)	4	(1)	9	(5)	25	(7)
14	3	(2)	11	(1)	8	(2)	23	(4)
15	7	(2)	15	(5)	25	(9)	47	(9)
16	4	(3)	4	(3)	6	(8)	14	(6)
17	8	(4)	4	(2)	3	(3)	15	(4)
18	9	(3)	8	(2)	10	(6)	27	(8)
19	11	(4)	16	(9)	11	(8)	38	(8)
20	9	(3)	5	(3)	16	(4)	30	(7)
21	12	(2)	6	(2)	24	(5)	42	(8)
22	9	(1)	7	(2)	5	(5)	21	(6)
23	12	(2)	8	(3)	7	(5)	27	(4)
24	9	(2)	6	(3)	14	(9)	29	(8)
25	5	(1)	4	(2)	7	(3)	17	(3)
Total Sample	8	(4)	7	(5)	14	(11)	29	(11)

Entries are: Mean (Standard Deviation)

Table 16

Non-Engaged Behavior (Percentages)
in Grade 5, by Class

Class	Reading							
	Interim		Wait		Off		Total	
1	10	(2)	3	(1)	4	(2)	16	(2)
3	10	(3)	2	(1)	8	(4)	21	(6)
4	6	(1)	1	(1)	12	(4)	19	(5)
5	10	(3)	3	(1)	20	(9)	33	(11)
6	8	(3)	6	(3)	38	(9)	52	(9)
8	9	(1)	1	(0)	7	(2)	17	(3)
9	8	(2)	5	(1)	6	(3)	18	(4)
10	5	(1)	6	(1)	3	(2)	13	(3)
11	9	(2)	1	(1)	9	(4)	19	(4)
12	12	(1)	1	(1)	9	(7)	22	(7)
14	6	(1)	4	(1)	14	(4)	25	(5)
16	6	(1)	5	(1)	16	(9)	27	(9)
17	12	(3)	5	(2)	20	(9)	37	(9)
18	5	(1)	1	(1)	15	(10)	22	(9)
19	10	(3)	7	(1)	13	(6)	31	(5)
21	8	(2)	6	(1)	12	(8)	25	(8)
23	9	(2)	2	(1)	11	(5)	22	(6)
24	13	(1)	3	(1)	11	(5)	28	(5)
25	7	(1)	4	(1)	20	(8)	30	(9)
26	12	(3)	5	(4)	20	(15)	37	(12)
27	8	(2)	3	(1)	21	(10)	32	(10)
Total Sample	9	(3)	4	(2)	14	(10)	26	(11)

Entries are: Mean (Standard Deviation)

Table 16 (continued)

Non-Engaged Behavior (Percentages)
in Grade 5, by Class

Class	Mathematics							
	Interim		Wait		Off		Total	
1	10	(3)	3	(2)	2	(2)	16	(3)
3	5	(2)	3	(2)	9	(5)	17	(4)
4	4	(2)	4	(1)	9	(7)	16	(7)
5	5	(2)	5	(3)	29	(10)	39	(9)
6	8	(3)	4	(2)	38	(12)	50	(9)
8	9	(2)	0	(1)	4	(5)	13	(6)
9	7	(2)	3	(1)	4	(2)	14	(2)
10	1	(1)	4	(2)	6	(5)	11	(6)
11	11	(2)	1	(1)	13	(10)	25	(10)
12	15	(4)	1	(1)	16	(8)	32	(9)
14	2	(2)	3	(2)	14	(4)	19	(5)
16	7	(3)	8	(4)	12	(8)	27	(10)
17	7	(3)	4	(3)	26	(16)	38	(14)
18	5	(2)	6	(2)	22	(12)	33	(12)
19	4	(2)	9	(3)	10	(8)	23	(6)
21	10	(3)	6	(4)	14	(7)	29	(11)
23	6	(1)	3	(2)	4	(2)	13	(1)
24	13	(2)	2	(2)	12	(5)	27	(5)
25	3	(2)	2	(1)	25	(13)	30	(12)
26	14	(2)	6	(4)	24	(15)	44	(14)
27	10	(3)	4	(1)	11	(5)	25	(5)
Total Sample	7	(4)	4	(3)	14	(12)	26	(13)

Entries are: Mean (Standard Deviation)

Table 17

Engagement and Difficulty (Percentages)
in Self-Paced and Other-Paced Settings,
by Grade and Subject Matter (Total Sample)

Grade Subject Setting		% of Subject	Sample Size*	Engagement Percentage*	Difficulty Percentages		
					% Easy	% Medium	% Hard
2 Reading	Self-Paced	63	139	68(11)	54(18)	44(17)	2(3)
	Other-Paced	46	139	84(10)	53(18)	45(16)	2(4)
2 Math	Self-Paced	73	139	67(13)	54(23)	42(21)	4(6)
	Other-Paced	27	139	82(11)	46(22)	49(22)	5(10)
5 Reading	Self-Paced	69	122	70(11)	50(16)	49(16)	1(2)
	Other-Paced	31	122	84(11)	43(17)	55(17)	2(3)
5 Math	Self-Paced	76	122	72(14)	37(22)	60(21)	3(7)
	Other-Paced	24	120	85(13)	35(28)	62(27)	3(8)

Entries are: Mean (Standard Deviation)

* Engagement and difficulty percentages are percentages of the time in that specific setting. These conditional percentages cannot be calculated for students who had no instructional time in the given setting. The sample size column indicates the number of students who entered into the engagement and difficulty calculations. All students were included in the calculation of the percentage of subject-matter time spent in each setting.

Tables 18, 19, 20, and 21 present the means and standard deviations for engagement and difficulty within each of the eight specific content areas of reading and the eleven areas of mathematics. The data are percentages for grade 2 reading (Table 18), grade 2 mathematics (Table 19), grade 5 reading (Table 20), and grade 5 mathematics (Table 21). The daily time in minutes for each of the specific subcategories of reading and mathematics is also presented so that the reader may be aware when a subcategory represents little or no time on a daily basis.

Note that the engagement rates are relatively consistent among the subcategories of reading and among those of mathematics. There was somewhat more variability among difficulty percentages for the subcategories of reading and mathematics. This was true even if RM and MB are ignored. (RB and MB are reading, below-test and mathematics, below-test respectively. These two categories are consistently high outliers for each percentages and low outliers for medium percentages. This is a necessary result of the definitions for these categories.)

Table 18

Daily Time (in Minutes)
Engagement and Difficulty (Percentages)
for Specific Content Areas
in Grade 2 Reading (Total Sample)

Specific Content Area	Daily Time	Sample Size*	Engagement Percentage*	Difficulty Percentages*		
				% Easy	% Medium	% Hard
DC**	11(6)	138	76(16)	48(26)	51(25)	1(3)
WS	4(3)	119	76(21)	46(30)	51(28)	4(12)
CP	11(5)	138	75(17)	39(25)	59(24)	3(6)
WM	9(6)	139	75(16)	49(27)	49(27)	1(3)
PT	23(9)	139	72(12)	56(26)	43(25)	1(4)
SP	4(3)	128	78(17)	55(32)	41(32)	4(10)
RR	17(7)	139	69(15)	43(21)	56(20)	2(5)
RB	9(5)	139	82(12)	96(8)	3(7)	0(2)

Entries are: Mean (Standard Deviation)

* The sample size varies for the different specific content areas because the percentages can not be calculated (as they are undefined) for those students who had no instructional time in a given specific content area. However, this applies only to the percentages given (Engagement and Difficulty). The means and standard deviations for Daily Time include the total sample of 139 students.

** DC = decoding
WS = word structure
CP = comprehension
WM = word meaning
PT = practice reading
SP = spelling
RR = reading related
RB = reading below test

Table 19

Daily Time (in Minutes)
Engagement and Difficulty (Percentages)
for Specific Content Areas
in Grade 2 Mathematics (Total Sample)

Specific Content Area	Daily Time	Sample Size*	Engagement Percentage*	Difficulty Percentages*		
				% Easy	% Medium	% Hard
AS**	8(5)	136	71(17)	69(27)	31(27)	0(2)
RG	7(5)	126	74(18)	35(34)	56(33)	8(16)
CT	6(5)	133	70(20)	51(33)	46(32)	3(9)
PV	6(5)	130	71(19)	47(33)	47(31)	6(13)
MU	1(1)	44	75(25)	29(37)	57(39)	14(26)
DI	0(0)	5	55(32)	9(19)	91(19)	0(0)
FR	1(2)	40	71(29)	45(42)	51(39)	4(10)
SA	1(1)	55	75(31)	49(45)	49(45)	2(14)
VA	1(2)	84	72(32)	39(44)	56(45)	5(18)
MR	4(3)	135	72(22)	49(33)	49(32)	1(5)
MB	2(2)	103	80(28)	91(23)	9(23)	0(0)

Entries are: Mean (Standard Deviation)

* The sample size varies for the different specific content areas because the percentages can not be calculated (as they are undefined) for those students who had no instructional time in a given specific content area. However, this applies only to the percentages given (Engagement and Difficulty). The means and standard deviations for Daily Time include the total sample of 139 students.

** AS = addition and subtraction without regrouping
RG = addition and subtraction with regrouping
CT = computational transfer
PV = place value
MU = multiplication
DI = division
FR = fractions
SA = spatial application
VA = verbal application
MR = mathematics related
MB = mathematics below test

Table 20

Daily Time (in Minutes)
Engagement and Difficulty (Percentages)
for Specific Content Areas
in Grade 5 Reading (Total Sample)

Specific Content Area	Daily Time	Sample Size*	Engagement Percentage*	Difficulty Percentages*		
				% Easy	% Medium	% Hard
DC**	2(2)	101	78(25)	46(39)	54(39)	1(4)
WS	5(5)	120	79(18)	45(28)	54(28)	1(9)
CP	22(9)	122	75(15)	24(20)	72(20)	4(6)
WM	12(6)	122	78(15)	42(23)	57(23)	1(3)
PT	25(10)	122	70(15)	68(22)	32(22)	0(1)
SP	8(3)	122	77(15)	49(23)	49(23)	2(6)
RR	28(9)	122	72(14)	39(18)	60(18)	1(2)
RB	7(5)	118	85(13)	99(4)	1(4)	0(1)

Entries are: Mean (Standard Deviation)

* The sample size varies for the different specific content areas because the percentages can not be calculated (as they are undefined) for those students who had no instructional time in a given specific content area. However, this applies only to the percentages given (Engagement and Difficulty). The means and standard deviations for Daily Time include the total sample of 123 students.

** DC = decoding
WS = word structure
CP = comprehension
WM = word meaning
PT = practice reading
SP = spelling
RR = reading related
RB = reading below test

Table 21

Daily Time (in Minutes)
Engagement and Difficulty (Percentages)
for Specific Content Areas
in Grade 5 Mathematics (Total Sample)

Specific Content Area	Daily Time	Sample Size*	Engagement Percentage*	Difficulty Percentages*		
				% Easy	% Medium	% Hard
AS**	0(1)	29	90(16)	84(30)	16(30)	0(0)
RG	1(1)	76	79(26)	69(36)	30(35)	1(4)
CT	2(2)	69	75(26)	31(36)	67(36)	2(8)
PV	0(1)	31	79(32)	31(42)	69(42)	0(0)
MU	6(6)	108	75(24)	47(35)	51(35)	2(8)
DI	9(8)	115	78(15)	42(36)	54(34)	3(9)
FR	11(10)	99	73(19)	24(26)	72(27)	4(13)
SA	3(3)	78	74(23)	31(40)	66(40)	3(10)
VA	3(4)	86	75(25)	28(35)	68(36)	4(12)
MR	8(10)	116	70(28)	42(35)	56(35)	2(8)
MB	2(2)	104	90(19)	97(15)	3(15)	0(0)

Entries are: Mean (Standard Deviation)

* The sample size varies for the different specific content areas because the percentages can not be calculated (as they are undefined) for those students who had no instructional time in a given specific content area. However, this applies only to the percentages given (Engagement and Difficulty). The means and standard deviations for Daily Time include the total sample of 123 students.

** AS = addition and subtraction without regrouping
RG = addition and subtraction with regrouping
CT = computational transfer
PV = place value
MU = multiplication
DI = division
FR = fractions
SA = spatial application
VA = verbal application
MR = mathematics related
MB = mathematics below test

V. SUMMARY

Descriptive statistics have been presented for ALT as measured with direct observation during the B-C period of Phase III-B. Engagement and difficulty levels for the second and fifth grade reading and mathematics instruction of this study have been examined from several different perspectives. An overview of the school day has been outlined. Engagement and difficulty data have been presented for both total samples (grades 2 and 5 in reading and in mathematics) and for individual classes within each sample. Data on non-instructional time have also been presented for total samples and for individual classes. Similarly, non-engaged student behavior has been examined for total samples and individual classes. Engagement and difficulty results have been examined within each of two instructional settings (self-paced and other-paced). Finally, engagement and difficulty data have been presented for each of the sub-categories of content observed within reading and within mathematics.

For many variables there was consistency across grade level and content area (reading and mathematics). However there is considerable variance within and across class on almost all variables. In addition, there have been many striking differences among the different categories of time observed. Interestingly, there has also been a general tendency for the mathematics domain to demonstrate greater variability than the reading doman.

When the descriptive statistics for the A-B period (Filby & Marliave, 1977) are compared to those in this report, striking similarities are found. At the level of total sample means, the data for the A-B and B-C periods

are remarkably consistent. Though there are some exceptions, at the level of class means the data are also highly consistent between the two periods.

This report presents descriptive statistics, not the findings of relational analysis, so there can be no relational conclusions to reach. However, there is much by which to be tantalized.

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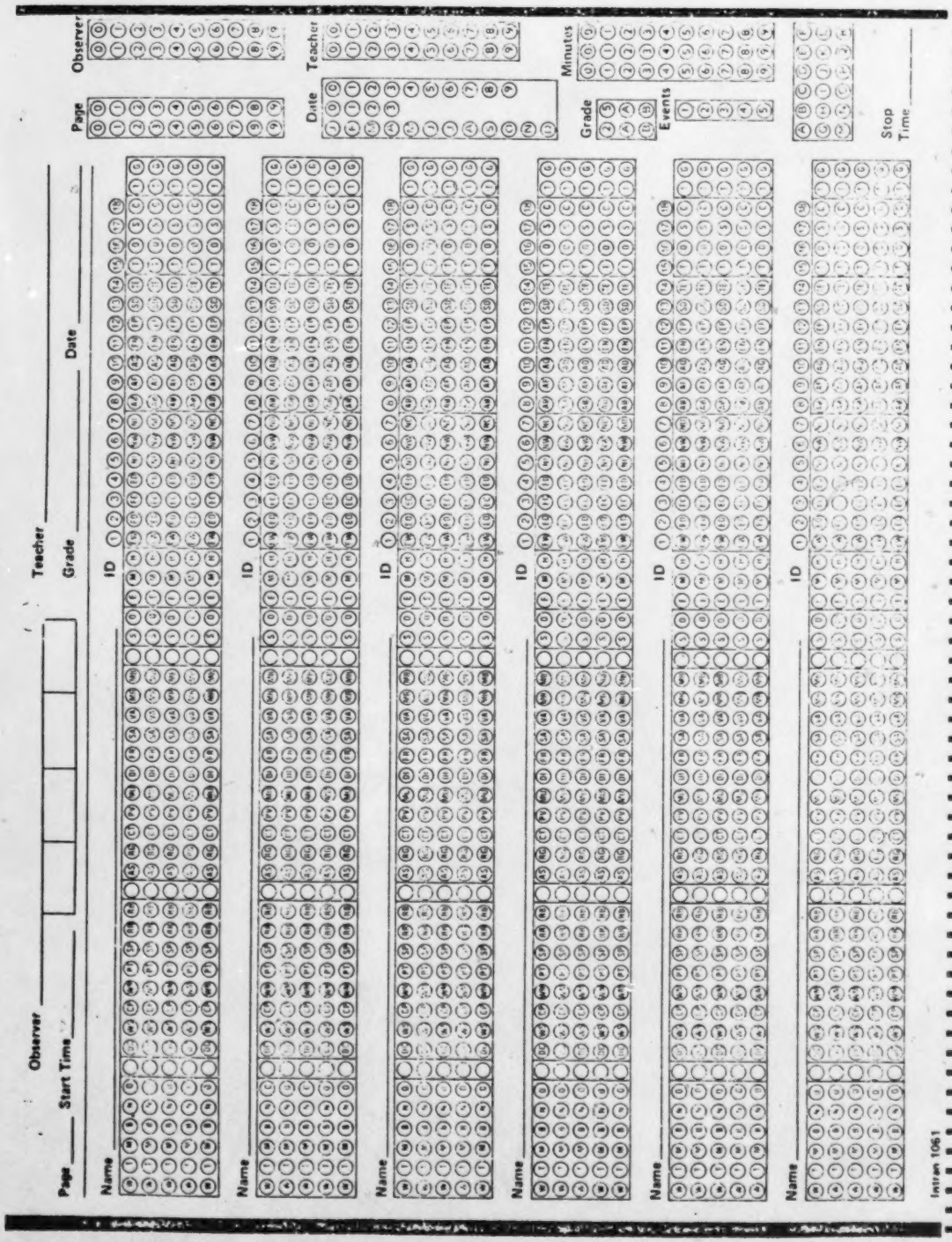
Appendix A

Optically-Scanned
Coding Form

Optically-scanned Coding Form

(slightly reduced)



Appendix B

Outline of Observation Categories

Outline of observation categories.

The following is a list of the observation categories with very brief descriptions of each.

General Content Categories

(General content includes periods other than reading or mathematics instruction. Any event that is coded in a general content category is not coded for any other categories, such as student and teacher behaviors.)

W = Wait

Wait refers to periods of no activity and no movement between activities. This would often occur when a student finishes his/her work early and no other activity is initiated.

T = Transition

Transition refers to periods of change from one activity to another. This might include lining up, taking seats, or quieting down before the next activity.

M = Management

Management refers to the conduct of class business that is unrelated to any instructional activity. This includes such things as the collection or distribution of milk money and making arrangements for a field trip.

B = Break

Break includes any recreational or free period, such as recess, unstructured P.E., lunch, milk breaks, and leaving class to use the restroom.

N = Nonacademic instruction

Nonacademic instruction refers to a wide range of organized classroom

activities that do not fall within a fairly narrow domain of academic instruction. Nonacademic instruction includes flag salutes, sharing, storytime, music, art, and structured P.E.

O = Other academic instruction

Other academic instruction refers to academic instruction other than reading and mathematics. This includes social studies and science (where there is no reading or mathematics content).

blank circle (between "O" and "DC" in the seventh column) = Absent

Reading Content Categories:

(The reading content categories correspond generally to categories found in the Reading Glossary for the daily logs at grades 2 and 5. The same observational categories are used at both grades. Therefore, some available categories will be observed primarily at one grade or the other).

DC = Decoding

WS = Word Structure

CP = Comprehension

WM = Word Meaning

PT = Practice, reading

SP = Spelling

RR = Reading Related

Reading related includes other reading content that is at or above the level of the tests to be used. Library skills would be coded RR.

RB = Reading, Below the test level

Reading below the test level includes other reading content that is at a lower level than the tests that will be used. Copying or handwriting would be coded RB.

Mathematics Content Categories:

(The mathematics content categories correspond generally to categories found in the Mathematics Glossary for the daily logs at grades 2 and 5. The same observational categories are used at both grades. Therefore, some available categories will be observed primarily at one grade or the other.)

AS = Addition and Subtraction with no regrouping, using the standard short form

RG = Regrouping, addition and subtraction using the standard short form

CT = Computational Transfer

PV = Place Value

Place value includes addition and subtraction without or with regrouping where an instructional algorithm involving a place value transformation is used.

MU = Multiplication

DI = Division

FR = Fractions

SA = Spatial Application

Spatial application includes geometry, measurement, and graphing without word problems.

VA = Verbal Application

Verbal application includes word problems.

MR = Mathematics Related

Mathematics related includes other mathematics content that is at or above the level of the tests to be used. Decimals would be coded MR.

MB = Mathematics, Below the test level

Mathematics below the test level includes other mathematics content that is at a lower level than the tests that will be used. Developmental

activities such as learning to count up to ten would be coded MB.

Setting Categories:

S = Self-paced

Self-paced includes activities where the student works at his own pace (such as seatwork).

O = Other-paced

Other-paced includes activities where the student must work at the pace of other students (such as group activities).

Difficulty Level Categories:

E = Easy

Easy includes review and practice. Few errors are made and little effort is required of the student.

M = Medium

Medium difficulty includes any activities between "easy" and "hard."

H = Hard

Hard includes those activities that the student cannot carry out. Many errors and few correct responses (about what you would expect by chance) occur.

Learner Moves:

(Learner moves coded must be those of the target student being sampled.)

EW = Engaged, Written response

EO = Engaged, Oral response (statement or question)

EC = Engaged, Covert response

Engaged, Covert responses includes any student response that is generally

not observable. This includes most activities where the student is simply thinking, such as listening to the teacher or reading silently.

ED = Engaged, Directions

The above categories for engaged learner moves must involve the substantive content of the reading or mathematics coded. Engaged, directions includes any written, oral, or covert student response that involves only the directions to the reading or mathematics activity.

NI = Not engaged, Interim activity

Not engaged, interim activity refers to the nonacademic interim tasks that are part of a reading or mathematics task. This includes sharpening pencils, turning in and passing out papers, and getting books.

NW = Not engaged, Waiting for help

Not engaged, waiting for help refers to periods where the student has stopped working on a reading or mathematics task because he is waiting for help.

NO = Not engaged, Off-task

Not engaged, off-task refers to periods where the student is inappropriately disengaged from a reading or mathematics task. This would include socializing, daydreaming, and misbehavior during a reading or mathematics task.

Instructor Moves:

(An instructor move is coded only if it is received by the target student and is therefore relevant to the behavior coded for the target student at that moment. For example, if the student continues to work on a reading assignment while the teacher gives instructions to get out the mathematics text, then the student engagement in reading is coded, with no instructor move for that student.)

AO = Academic Observational monitoring

Academic observational monitoring consists of the instructor looking at or listening to a student response during a reading or mathematics task.

AF = Academic Feedback

Academic feedback refers to the teacher informing the student that a written or oral response was correct or incorrect. Any explanation is more than academic feedback.

AQ = Academic Question

An academic question consists of the teacher asking the student for a written or oral answer.

EN = Explanation, Need

Explanation, need refers to instructional explanation provided to the student to satisfy a clear and immediate student need for help.

EP = Explanation, Planned

Explanation, planned refers to instructional explanation provided according to previous plans of the instructor. This would include lectures. Explanation, planned may involve a general student need, but not an immediate student need.

SD = Structure or Direct

As with the other instructor moves, this move must be relevant to the reading or mathematics task coded at the same moment. Structure or direct refers to statements of goals or objectives and the provision or instructions or directions.

TE = Task Engagement feedback

Task engagement feedback refers to the instructor's moves to control inappropriate student behavior, such as off task behavior, or to praise appropriate behavior, such as good work habits. However,

inappropriate and appropriate student behavior does not refer, here, to correct and incorrect responses to a reading or mathematics task. Teacher feedback for these responses would, as discussed above, be coded AF.

Source of Instructor Move:

T = Teacher

Teacher refers, here, to the instructor in charge of the class unit in which the observation takes place. This might be a reading or mathematics specialist during the student's reading or mathematics laboratory period.

O = Other adult

Other adult refers to an instructor who is not in charge of the class unit. This might be an aide or parent volunteer.

S = Student

Student is coded as the source of instruction when the target student is receiving instructional assistance (usually tutoring) from another student.

C = Curriculum

Curriculum is coded as the source of instruction when answers provided in the curriculum materials are used by the student to obtain academic feedback. Therefore, the source code, C, is used only with the instructor move code, AF.

Focus of Instructor Move:

T = Target

The target student is the focus of the instructor move only when that move is directed specifically to that individual target student.

G = Group

A group is the focus of the instructor move when the target student of the moment is in a group (two or more) that receives an instructor move. The group is coded when the instructor move is directed to the group as a whole or to some student in the group other than the target student (so long as the move is relevant to the target student).